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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/559,698

03/29/2007

Axel Clausen

1890-0334

3814

50255

7590

12/18/2009

MAGINOT, MOOR & BECK  
111 MONUMENT CIRCLE, SUITE 3000  
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EXAMINER

HO, CHUONG T

ART UNIT

PAPER NUMBER

2476

MAIL DATE

DELIVERY MODE

12/18/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/559,698	<b>Applicant(s)</b> CLAUSEN ET AL.	
	<b>Examiner</b> CHUONG T. HO	<b>Art Unit</b> 2476	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 21 February 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 12-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement (IDS) submitted on 06/11/07 was filed. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.
2. Claims 12-18, 19-27 are pending.

### ***Specification***

3. The disclosure is objected to because of the following informalities: "According to the invention, this object is achieved by a method having the features of Claim 1 and by a circuit having the features of Claim I0".

Appropriate correction is required.

### ***Drawings***

4. The drawings are objected to under 37 CFR 1.83(a) because they (the rectangular boxes in figures 1-4) fail to show descriptive text labels as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an

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amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency.

Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

5. Claims 1, 19 are objected to because of the following informalities: the acronym “IFFT” needs to be spelled out. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 101***

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 12 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

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Claim recites, "A method of reducing a crest factor of a data symbol to be transmitted in a multi-carrier data transmission system, in which the data symbol is a function of a plurality of signals provided within a predetermined time interval, each of the plurality of signals allocated to a carrier, each carrier occupying at least one frequency from a transmit data spectrum, at least one carrier having at least some reserved data carrying capacity, the method comprising:

- (a) performing an IFFT transformation of the data symbol to be transmitted;
  - (b) identifying peak values within a frame of the IFFT-transformed data symbol above a predetermined threshold;
  - (c) providing a sample correction function;
  - (d) generating one or more vectors by allocating a scaling and phase rotation to the sample correction function according to the amplitude and position of the identified peak values;
  - (e) generating a correction signal in the frequency domain from a linear combination of the one or more vectors; (f)
- modifying the peak value of the data symbol to be transmitted by subtracting the correction signal; and
- (g) providing the modified data symbol in the time domain"

Claim 1 is rejected under 35 U.S.C. 101 because they do not fall within one of the four statutory categories of invention. While the claims recite a series of steps or acts to be performed, a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a manufacture or machine), or (2) transform

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underlying subject matter (such as an article or material) to a different state or thing.

The instant claim neither transform underlying subject matter nor recite structure associated with another statutory category, and therefore do not define a statutory process.

The claim elements "performing, identifying, providing, generating, modifying, and providing... "

1) do not tied to another statutory class (such as a particular apparatus) by identifying the apparatus that accomplishes the method steps

2) not structure required by the claim, or positively recited in the body of the claim in association with a step significant to the inventive concept.

A claim reciting an adequate structural tie must positively recite the structure of another statutory category in association with a step significant to the inventive concept. The following are examples of structural recitations that do not constitute adequate structural ties per se: (1) Structure recited in a preamble alone, (2) structure in a phrase expressing intended use or purpose, and (3) structure in a step insignificant to the inventive concept, such as nominal pre or post solution activity.

Claims 13-18 are also rejected since they are depended upon rejected claim 12 as set forth above

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 19-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bourget et al. (Patent No.: US 6,845,082 B2) in view of Henkel et al. (PAR reduction revisited: an extension to Tellado's method; 6<sup>th</sup>, International OFDM Workshop; 2001; Pages 31-1 – to 31-6).

Regarding to claim 19, Bourget '082 disclose a circuit for reducing a crest factor of a data symbol to be transmitted in a multi-carrier data transmission system, in which the data symbol to be transmitted is a function of a plurality of signals provided within a predetermined time interval, each of the plurality of signals allocated to a carrier, each carrier in each case occupying at least one frequency from a transmit data spectrum, at least one carrier having at least some reserved data carrying capacity, comprising:

(A) a transmit signal path configured to propagate a data signal to be transmitted (figure 4, DMT symbols  $X(n)$ ) (col. 6, lines 10-67) ;

(B) a second signal path (figure 4, Sum of  $A, K(n - n(1))$ ) arranged in parallel with at least a portion of the transmit path (col. 6, lines 10-67) ,

the second signal path including,

a first IFFT module (figure 4, Modulator 104) configured to transform the data symbol to be transmitted into the time domain (col. 6, lines 66 – col. 7, lines 10, time domain),

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a first unit (figure 4, 410) configured to determine at least one peak value within a predetermined time interval of the transformed data signal (col. 6, lines 10 – col. 7, lines 10, time domain),

a second unit configured to generate a correction signal in the frequency domain from a linear combination of  $x(n)$  and scaled vectors (col. 4, lines 40-60, scaled) according to a scaling and position of the peak values determined (col. 6, lines 10 – col. 7, lines 10) ; and

(C) a combining device (figure 4,  $Y(n)$ ) connected to an output of the second signal path (figure 4, Sum of A,  $k(n - n(1))$ ) and to the transmit path  $x(n)$  configured to superimpose the correction signal on the data symbol to be transmitted on the transmit signal path (col. 6, lines 10 – col. 7, lines 10).

However, Bourget '082 are silent to disclose combination of rotated and scaled vectors according to a scaling and position of the peak values determined.

Henkel, from the same or similar fields of endeavor disclose combination (figure 5,  $X(i + 1)$ ) of rotated (figure 5,  $x(i)$ ) and scaled vectors (page 31-3, vectors) according to a scaling and position of the peak values determined (figure 5, combination of  $X(i)$  and  $P(m \bmod L)$ ) (figure 4, figure 5) (page 31-3 phase rotation).

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply combination of rotated and scaled vectors according to a scaling and position of the peak values determined taught by Henkel into the system of Bourget '082; since Henkel recited the motivation in page 31-1 which reduces peaks in the time domain by iterative subtraction of Dirac-like functions.



Regarding to claim 20, Bourget '082 disclose the limitations of claim 19 above.

However, Bourget '082 are silent to disclose (D) a second IFFT module configured to transform the data symbol modified by the correction signal.

Henkel disclose a second IFFT module (IFFT (LN)) configured to transform the data symbol modified by the correction signal

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply a second IFFT module configured to transform the data symbol modified by the correction signal taught by Henkel into the system of Bourget '082; since Henkel recited the motivation in page 31-1 which reduces peaks in the time domain by iterative subtraction of Dirac-like functions.

Regarding to claim 21, Bourget '082 disclose the limitations of claim 19 above.

However, Bourget '082 are silent to disclose wherein the second signal path further comprises a second IFFT module configured to transform the correction signal into the time domain, and wherein the second IFFT module is operably coupled to provide the transformed correction signal to the combining device.

Henkel from the same of similar fields of endeavor disclose wherein the second signal path further comprises a second IFFT module configured to transform the correction signal into the time domain, and wherein the second IFFT module is operably coupled to provide the transformed correction signal to the combining device (figure 4,

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first IFFT (N) configured to transform the correct signal P (I), the second IFFT (LN) configured to transform the correct signal P' (I).

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply wherein the second signal path further comprises a second IFFT module configured to transform the correction signal into the time domain, and wherein the second IFFT module is operably coupled to provide the transformed correction signal to the combining device taught by Henkel into the system of Bourget '082; since Henkel recited the motivation in page 31-1 which reduces peaks in the time domain by iterative subtraction of Dirac-like functions.

Regarding to claim 22, Bourget '082 disclose the limitations of claim 19 above. However, Bourget '082 are silent to disclose wherein the second signal path further comprises an oversampling unit configured to oversample the data symbol to be transmitted.

Henkel disclose wherein the second signal path further comprises an oversampling unit configured to oversample the data symbol to be transmitted (page 31-2, oversampling).

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply wherein the second signal path further comprises an oversampling unit configured to oversample the data symbol to be transmitted taught by Henkel into the system of Bourget '082; since Henkel recited the motivation in page 31-1 which reduces peaks in the time domain by iterative subtraction of Dirac-like functions.

Regarding to claim 23, Bourget '082 disclose wherein the second signal path further comprises a non-recursive model filter having a characteristic of one or more filters (figure 4, FILTERS 110) following the combining device (col. 6, lines 10 – col. 7, lines 10, filters).

Regarding to claim 24, Bourget '082 disclose wherein the non-recursive model filter comprises an FIR filter (figure 4, FILTERS 110, col. 6, lines 10 - col. 7, lines 10).

Regarding to claim 25, Bourget '082 disclose wherein the first unit comprises a programmable processing device (figure 4, col. 6, lines 20-55, the first unit 410 comprising a programmable processing device.

Regarding to claim 26, Bourget '082 discloses wherein the second unit comprises a programmable processing device (figure 4, col. 6, lines 20-55, the second unit 412 comprising a programmable processing device.

Regarding to claim 27, Bourget '082 disclose the limitations of claim 19 above.

However, Bourget '082 are silent to disclose wherein the second IFFT module is configured such that only a first set of carrier frequencies corresponding to the at least one carrier having at least some reserved data carrying capacity can be supplied to the

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second IFFT module, and wherein a second set of carrier frequencies can be supplied to the first IFFT module.

Henkel disclose wherein the second IFFT module (figure 4, IFFT (LN)) is configured such that only a first set of carrier frequencies corresponding to the at least one carrier having at least some reserved data carrying capacity can be supplied to the second IFFT module (figure 4, IFFT (LN)), and wherein a second set of carrier frequencies can be supplied to the first IFFT module (figure 4, IFFT (N)).

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply wherein the second IFFT module is configured such that only a first set of carrier frequencies corresponding to the at least one carrier having at least some reserved data carrying capacity can be supplied to the second IFFT module, and wherein a second set of carrier frequencies can be supplied to the first IFFT module taught by Henkel into the system of Bourget '082; since Henkel recited the motivation in page 31-1 which reduces peaks in the time domain by iterative subtraction of Dirac-like functions.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHUONG T. HO whose telephone number is (571)272-3133. The examiner can normally be reached on 8:00 am to 4:00 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sheikh Ayaz can be reached on (571) 272-3795. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Chuong. T. Ho./  
Examiner, Art Unit 2476

/Ayaz R. Sheikh/

Supervisory Patent Examiner, Art Unit 2476

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